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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/566,949

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Shigeru Ichihara

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EXAMINER

LEADER, WILLIAM T

ART UNIT

PAPER NUMBER

1795

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/566,949	<b>Applicant(s)</b> ICHIHARA ET AL.	
	<b>Examiner</b> WILLIAM T. LEADER	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 7-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Receipt of the papers filed on September 22, 2008, is acknowledged. Claims 1-11 are pending. Claims 7-11 remain withdrawn from consideration.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Applicant's Amendments to the claims have overcome the rejections of record which are based on Kobayashi et al.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. Claim 1 is directed to a plating solution. Applicant has amended claim 1 to recite a result obtained by using the plating solution, i.e., the solution is such that a composition consisting of Fe and Pt or Fe, Pt and Cu is deposited when plating using the solution. This newly added limitation renders the claim indefinite. Whether a constituent in a plating solution is deposited depends on the manner in which the solution is used. Electrolytic reactions are characterized by

an electric potential, conventionally measured relative to a standard hydrogen electrode. Each of the species contained in an electrolytic deposition solution is reduced from the ionic state to the metal state at a particular potential. See the Electrochemical Series in the Handbook of Chemistry and Physics 57<sup>th</sup> edition pages D143-D145. In carrying out an electrolytic plating process, one of the factors controlling whether any given species contained in the solution is deposited is the applied potential. As shown by the Handbook, the reduction potential of bivalent platinum in the reaction  $\text{Pt}^{+2} + 2\text{e}^- \leftrightarrow \text{Pt}$  equals  $\sim 1.2$ . The reduction of potential of trivalent gold in the reaction  $\text{Au}^{+3} + 3\text{e}^- \leftrightarrow \text{Au}$  equals 1.4. Thus, it is possible to have a solution which contains gold as well as ionic Fe and ionic Pt but, depending on the applied potential, to deposit platinum and iron while not depositing gold when using the solution. It is not possible to determine the scope of claim 1 as amended. See, for example, figure 1 of Mahrus et al (US 5,156,729) for an illustration of the variation of the composition of a deposit with applied potential. The plating solution contains lead, but whether lead is deposited or not when using the plating solution depends on the applied potential.

***Claim Rejections - 35 USC § 102***

7. Claims 1-3, 5 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Daimon et al (US 2004/0074336) for the reasons of record.

***Claim Rejections - 35 USC § 103***

8. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Rhen et al article “Electrodeposited FePt films” in view of either Sallo et al (US 3,032,486) or Commander et al (US 5,435,898).

9. The Rhen et al article discloses a plating solution which comprises ionic Fe in the form of 0.1 M/l FeSO<sub>4</sub> and ionic Pt in the form of 1mM/l H<sub>2</sub>PtCl<sub>6</sub>. When the plating solution was used, a composition consisting of Fe and Pt was formed. The composition of the deposited films depended on the current density. Values of about 20 mA/cm<sup>2</sup> resulted in a 50% Fe - 50% Pt composition in the films.

10. The solution recited in claim 1 as amended differs from the solution of Rhen et al by additionally comprising a “complex agent”, and by reciting a molar ratio of the ionic Fe to the ionic Pt of from 0.75 to 3. As indicated in the previous office action, the Sallo et al patent is directed to a plating bath for electrodeposition of ferromagnetic materials. The plating bath contains an iron salt such as ferrous chloride. Sallo et al teach that since hydrated oxides of iron precipitate even in acid baths, it is necessary to utilize a complexing agent to maintain the plating bath in solution. The preferred complexing agent is ammonium citrate (column 2, lines 16-21).

11. The Commander et al patent is directed to electroplating baths for depositing alloys such as zinc-iron. See the abstract. Commander et al teach the inclusion of a chelating (complexing) agent in an effective amount to maintain the metals in the bath in solution, e.g., to dissolve the required amount of iron and other alloy ingredients in the bath. Examples of suitable chelating

agents include hydroxy carboxylic acids and salts such as citrates, and tartrates. See column 4, lines 47-64.

12. It would have been obvious at the time the invention was made to have included a complex agent such as a citrate compound in the FePt plating solution of Rhen because it would have been effective in maintaining the iron in solution as taught by Sallo et al or Commander et al. Concentration of metals to be deposited from a plating solution is a result-effective variable. Choice of appropriate amounts of ionic Fe and ionic Pt in the plating bath of Rhen et al in the presence of a complex agent to produce the 50% Fe - 50% Pt composition would have been a matter of routine optimization. It is noted that applicants include a complex agent for keeping ionic iron in solution (page 7, lines 17-23) which is the same function disclosed by Sallo et al and Commander et al. It is additionally noted that FePt material of applicant's invention contains Fe at around 50 at% which is the same amount disclosed by Rhen et al.

13. With respect to claim 2, the complexing agents disclosed by Sallo et al and Commander et al are citrate compounds. With respect to claim 3, the 0.1 M/l concentration of  $\text{FeSO}_4$  disclosed by Rhen et al falls within the range recited by applicant.

14. Instant claim 4 recites a pH range of 5.0 – 10.5. As noted above, Sallo et al disclose that hydrated oxides of iron begin to precipitate even in acid solutions. Commander et al teach that the chelating agent should complex metal ions to an electrodepositable extent in a strong alkalinity of a pH of above 13 (column 4, lines 53-56). Thus, it is recognized in the art that iron-containing alloys may be deposited in baths with a pH ranging from acidic to strongly alkaline.

Choice of an appropriate pH for the particular alloy being deposited from within the recognized range would have been a matter of routine optimization.

15. With respect to claim 5, the citrate suggested by Sallo et al or Commander et al would have served to complex with platinum as well as iron so that both an iron complex and a platinum complex would have been formed.

### ***Response to Arguments***

16. The arguments submitted on September 22, 2008, with respect to the rejection under 35 U.S.C. 103 based on Kobayashi et al have been considered but are moot in view of the new ground(s) of rejection. Applicant's other arguments have been carefully considered but are not deemed to be persuasive.

17. With respect to the rejection under 35 U.S.C. 102 over Daimon, at page 5 of the Remarks, applicant argues that even though this reference discloses the use of an iron (III) acetylacetonato complex, a platinum (II) acetylacetonato complex, and copper (II) sulfate, it does not disclose or suggest a solution from which a composition of FePt or FePtCu with no other component therein is deposited. This argument is not convincing. Applicant's claims are directed to a solution. The solution of Daimon includes all of the constituents of the solution claimed by applicant. The solution of Daimon is capable of providing the results now recited by applicant. There is no metal component other than Fe, Pt and Cu in the solution of Daimon so that no component other than these three metals would be deposited.

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM T. LEADER whose telephone number is (571) 272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/  
Primary Examiner, Art Unit 1795

/William Leader/  
December 30, 2008